

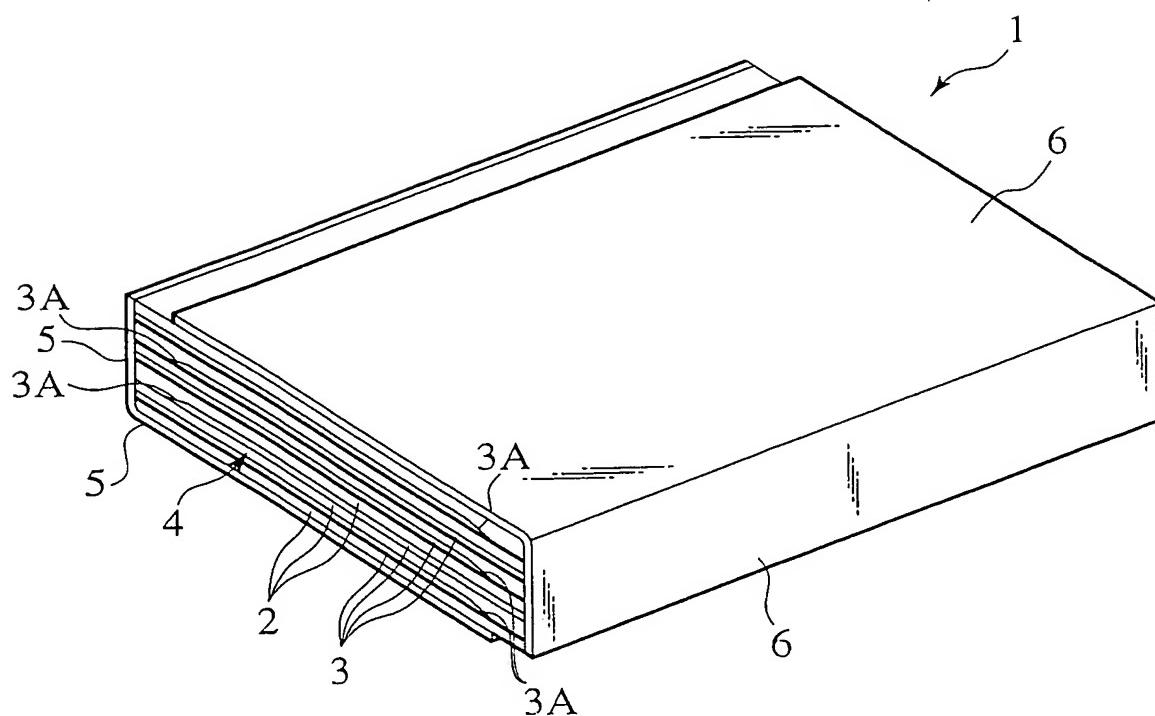
Applicant(s): Masahiko NAMERIKAWA, Kazuyoshi SHIBATA and Masaki IWAMOTO
Serial No.: 10/650,488

Title: LAMINATE-TYPE PIEZOELECTRIC DEVICE AND METHOD FOR MANUFACTURING THE SAME
Our Docket No.: 815_010



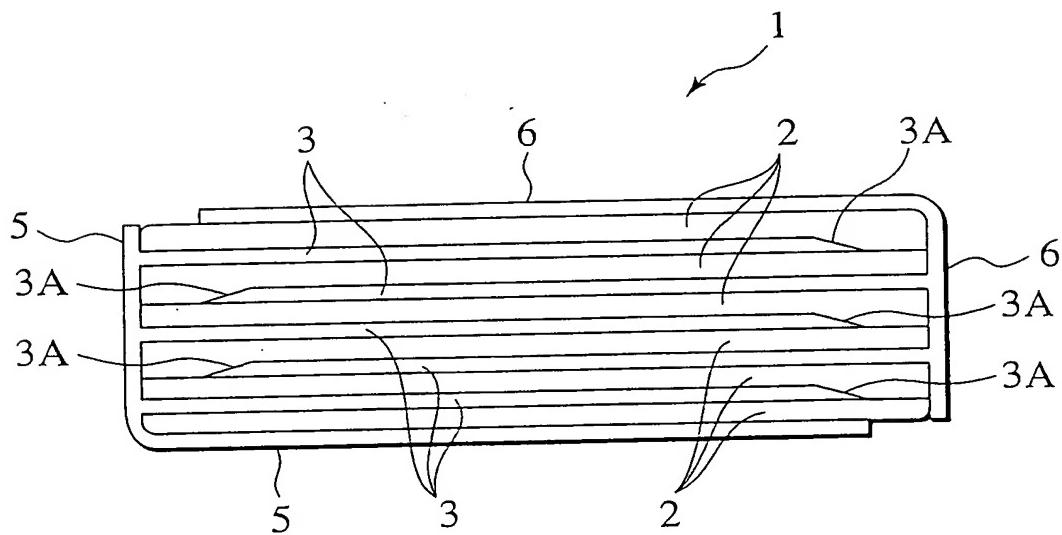
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FIG.1



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FIG.2



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FIG.3

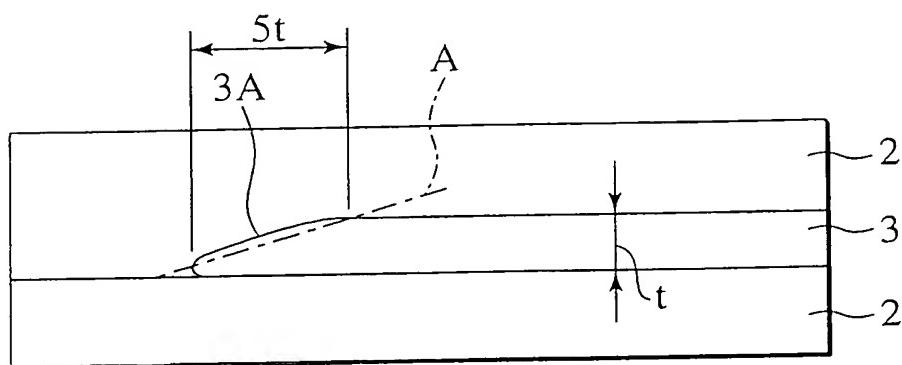
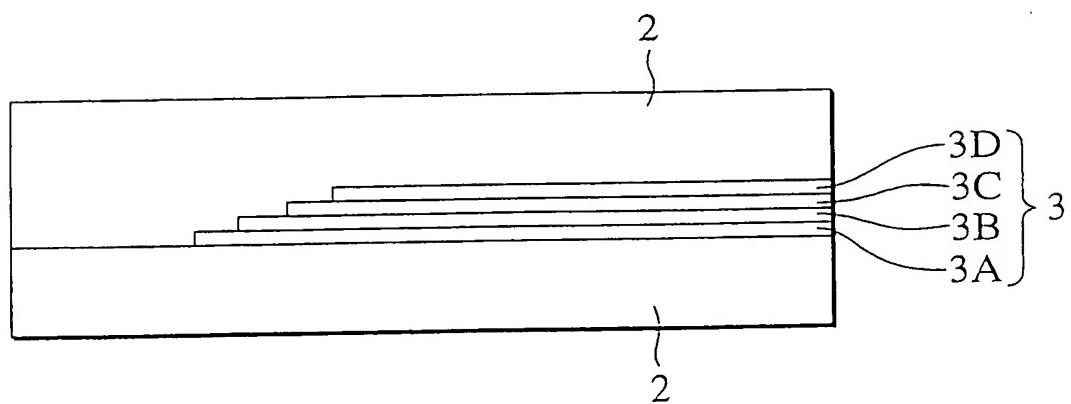
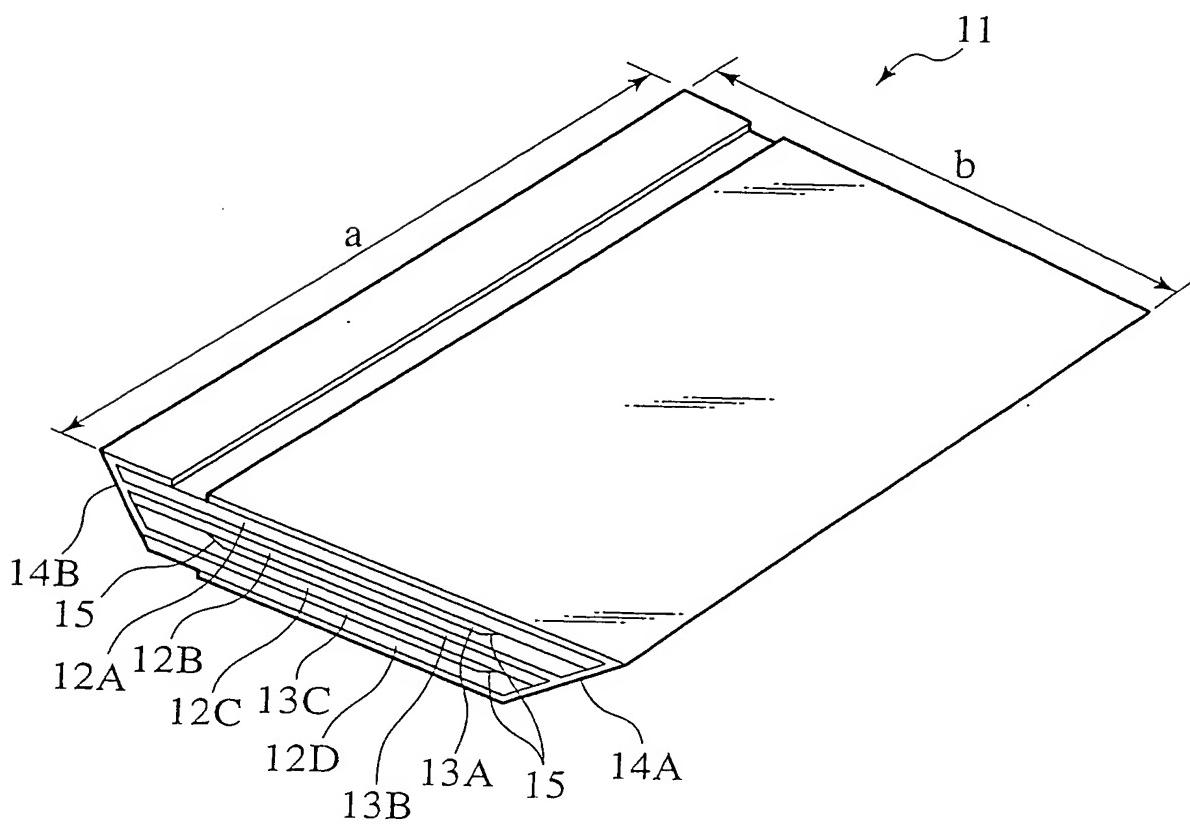


FIG.4



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FIG.5



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FIG.6

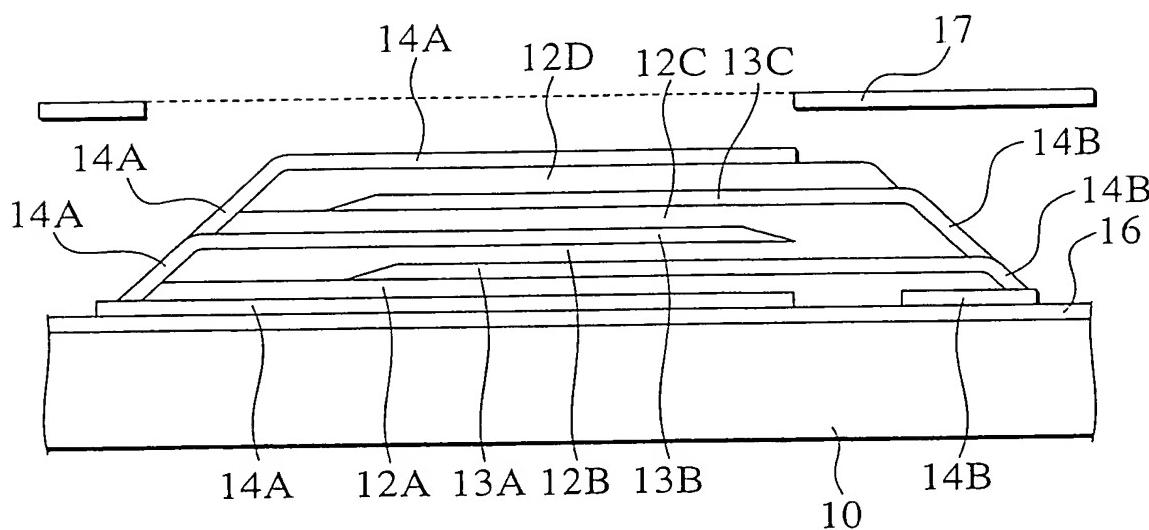
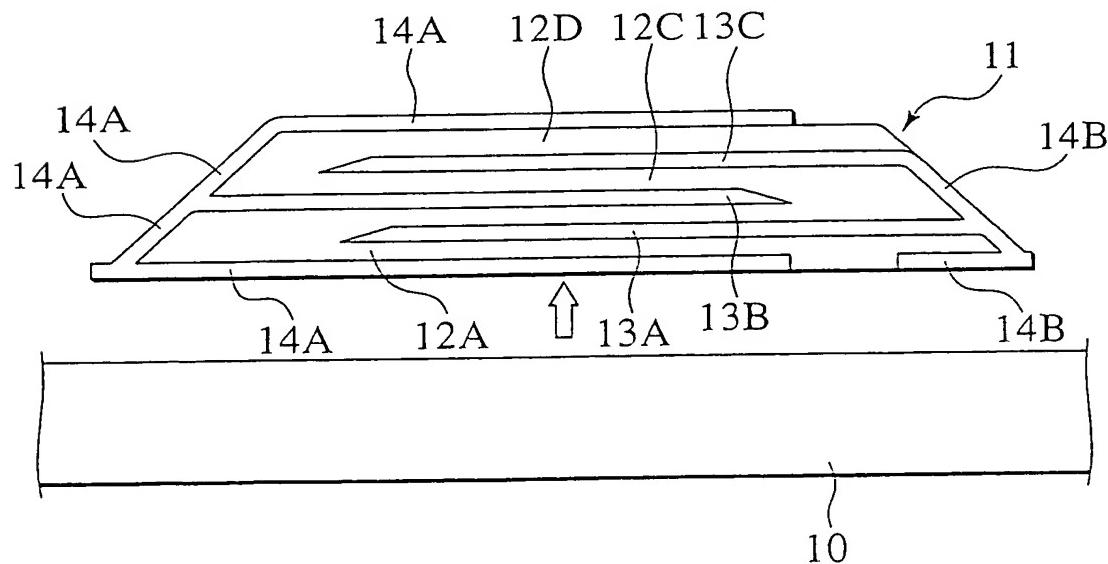


FIG.7



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FIG.8

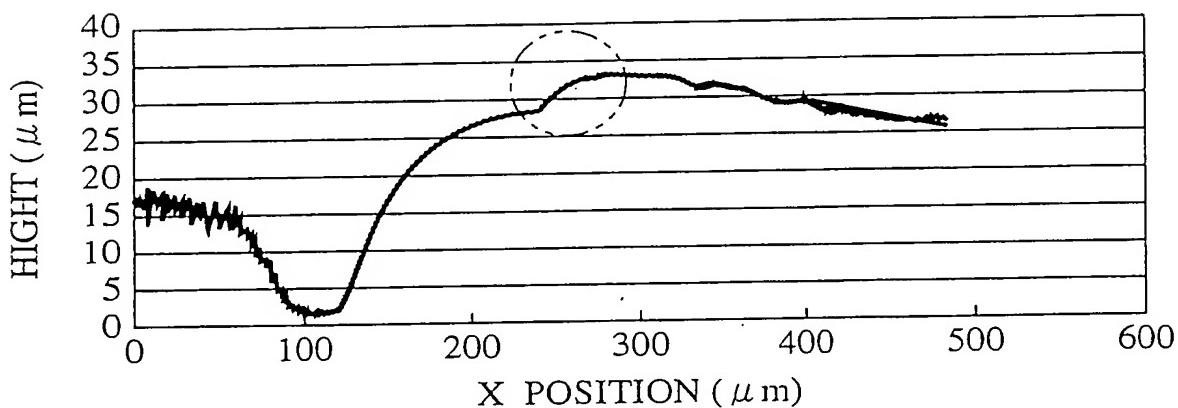
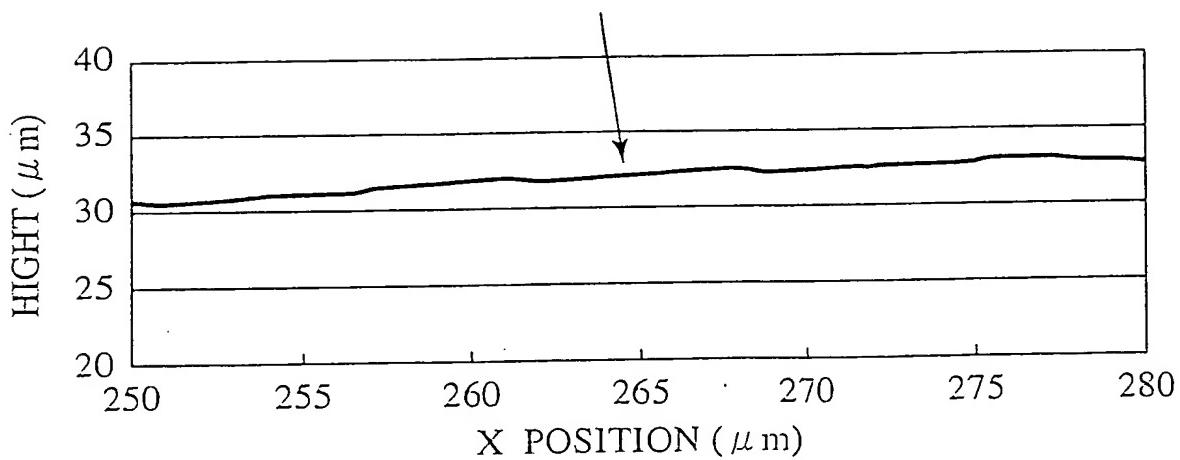


FIG.9



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FIG.10

ELECTRODE PASTE PARTICLE DIAMETER, MEAN (μm)	ELECTRODE PASTE BINDER, PART (wt%)	ELECTRODE PASTE SOLVENT, PART (wt%)	ELECTRODE PASTE VISCOSITY (Pa · sec)	NONFIRED CERAMIC LAYER SURFACE ROUGHNESS ($\text{Ra}, \mu\text{m}$)	ELECTRODE ANGLE (deg.)
0.050	5.0	10	4200	0.3	35
4.5	5.0	10	50	0.3	1.7
1.5	5.0	25	25	0.3	1.4
1.5	5.0	4.0	3300	0.3	33
1.5	5.0	10	300	0.3	14
1.5	0.7	10	32	0.3	1.8
1.5	12	10	3100	0.3	32

FIG.11

PIEZOELECTRIC / ELECTROSTRICITIVE PASTE		NONFIRED CERAMIC LAYER SURFACE ROUGHNESS ($\text{Ra}, \mu\text{m}$)	ELECTRODE PASTE VISCOSITY (Pa · sec)	ELECTRODE ANGLE (deg.)
POWDER PARTICLE DIAMETER, MEDIAN (μm)	BINDER, PART (wt%)			
0.050	5.0	0.090	300	5.0
5.2	5.0	0.60	300	31
0.50	31	0.060	300	3.0
0.50	0.4	0.70	300	33
0.50	5.0	0.10	300	6.0
0.50	5.0	0.60	300	32